WHAT IS CLAIMED IS:

1. A one-piece field core shell that is formed from a disc having top and bottom external surfaces comprising:

an outer annular ring integral to and encircling a center axis of the disc and extending from the bottom external surface in a direction that is perpendicular to the bottom surface of the disc and parallel to the center axis of the disc;

an inner annular ring integral to and encircling a center axis of the disc, said inner annular axis spaced radially inward from said outer annular ring and extending from the bottom external surface in a direction that is perpendicular to the bottom surface of the disc and parallel to the center axis of the disc; and

a mounting flange integral to the disc and having a bore extending from the mounting flange to the bottom external surface of the disc.

2. The field core shell as claimed in claim 1 wherein the mounting flange encircles a center axis of the disc and extends in a perpendicular direction to the top external surface of the disc and parallel to the center axis of the disc.

3. The field core shell as claimed in claim 2 wherein the bore is sized for attachment to a shaft.

4. The field core shell as claimed in claim 2 wherein said inner annular ring and said outer annular ring form a wire winding pod having a top surface, said wire winding pod having a hole through the top surface of the wire winding pod to feed wire leads.

5. The field core shell as claimed in claim 2 wherein the inner annular ring and the outer annular ring extend in a direction that is perpendicular to the bottom surface of the disc and parallel to the center axis of the disc by the same distance.

6. The field core shell as claimed in claim 2 wherein the inner annular ring and the outer annular ring extend in a direction that is perpendicular to the bottom surface of the disc and parallel to the center axis of the disc and are tapered at an angle alpha.

7. The field core shell as claimed in claim 1 wherein the mounting flange extends parallel to a plane of the top external surface of the disc.

8. The field core shell as claimed in claim 7 wherein the bore is sized for attachment to a shaft.

9. The field core shell as claimed in claim 7 wherein said inner annular ring and said outer annular ring form a wire winding pod having a top surface, said wire winding pod having a hole through the top surface to feed wire leads.

10. The field core shell as claimed in claim 7 wherein the inner annular ring and the outer annular ring extend in a direction that is perpendicular to the bottom surface of the disc and parallel to the center axis of the disc by the same distance.

11. The field core shell as claimed in claim 7 wherein the inner annular ring and the outer annular ring extend in a direction that is perpendicular to the bottom surface of the disc and parallel to the center axis of the disc and are tapered at an angle alpha.

12. A one-piece field core shell comprising:
a stamped wire winding pod having a top surface, the wire winding pod consisting of inner and outer annular rings; and
a mounting flange integral to the wire winding pod and having a bore extending from the mounting flange and through the center of the wire winding pod.

13. The field core shell as claimed in claim 12 wherein the mounting flange is spin-roll formed.

14. The field core shell as claimed in claim 13 wherein the mounting flange encircles a center axis of the wire winding pod and extends in a perpendicular direction to the top surface of the wire winding pod and parallel to the center axis of the wire winding pod.

15. The field core shell as claimed in claim 13 wherein the mounting flange extends parallel to a plane of the top surface of the wire winding pod.

16. The field core shell as claimed in claim 14 or 15 wherein the bore is sized for attachment to a shaft.

17. The field core shell as claimed in claim 14 or 15 wherein said top surface of said inner and outer annular rings having a hole through the top surface to feed a wire lead.

18. The field core shell as claimed in claim 14 or 15 wherein the inner annular ring and the outer annular rings are the same distance in length.

19. The field core shell as claimed in claim 14 or 15 wherein the inner annular ring and the outer annular ring are tapered at an angle alpha.

20. Method for forming a one-piece field core shell having an inner and an outer annular ring, and a mounting flange, which comprising the steps of:

placing an annular disc sheet metal workpiece in a flow-forming machine and supporting said workpiece with a headstock mandrel and a mounting flange forming mandrel;

pressing a shaping roller against a side of said annular disc and spinning said annular disc;

moving the shaping roller progressively radially inward against the side of said spinning disc and displacing a portion of metal while thinning part of the disc, forming said mounting flange;

removing said disc with said mounting flange formed and inverting said disc by 180 degrees from its formed position;

placing said disc with said mounting flange formed, in said flow-forming machine and supporting said workpiece with a mounting flange mandrel and an inner annular ring forming mandrel;

pressing a shaping roller against a side of and spinning said annular disc with the mounting flange formed;

moving the shaping roller progressively radially inward against the side of the rotating disc with the mounting flange formed and displacing a portion of metal while thinning part of the disc forming said inner annular ring;

removing said disc with said mounting flange formed and inverting said disc by 180 degrees from its formed position;

placing said disc with said mounting flange and inner annular ring formed, in said flow-forming machine and supporting said workpiece with a mounting flange mandrel and an outer annular ring forming mandrel;

moving an outer annular ring forming tool radially inward against the side of the rotating disc with the mounting flange formed and the inner annular ring formed and displacing a portion of said metal forming said outer annular ring; and

forming a bore and a hole to feed wire leads.

21. Method for forming a one-piece field core shell having an inner and an outer annular ring, and a mounting flange, which comprises:

placing an annular disc sheet metal workpiece in a flow-forming machine and supporting said workpiece with a headstock mandrel and an inner annular ring forming mandrel;

pressing a shaping roller against a side of said annular disc and spinning said annular disc;

moving the shaping roller progressively radially inward against the side of said spinning disc and displacing a portion of metal while thinning part of the disc, forming said inner annular ring;

removing said disc with said inner annular ring formed and inverting said disc by 180 degrees from its formed position;

placing said disc with said inner annular ring formed, in said flow-forming machine and supporting said workpiece with a inner annular ring mandrel and an outer annular ring forming mandrel;

moving an outer annular ring forming tool radially inward against the side of the rotating disc with the inner annular ring formed and displacing a portion of said metal forming a radially extending surface of the outer annular ring;

forming a mounting flange; and

forming a bore and a hole to feed wire leads.

22. Method for forming a one-piece field core shell having an inner and an outer annular ring, and a mounting flange, which comprises:

placing an annular disc sheet metal with a hole in its center workpiece in a flow-forming machine and supporting said workpiece with a headstock mandrel and a mounting flange forming mandrel;

forming a mounting flange;

pressing a shaping roller against a side of said annular disc and spinning said annular disc;

moving the shaping roller progressively radially inward against the side of said spinning disc and displacing a portion of metal while thinning part of the disc, forming said inner annular ring;

removing said disc with said mounting flange and inner annular ring formed and inverting said disc by 180 degrees from its formed position;

placing said disc with said inner annular ring formed and mounting flange formed in said flow-forming machine and supporting said workpiece with a inner annular ring mandrel and an outer annular ring forming mandrel;

moving an outer annular ring forming tool radially inward against the side of the rotating disc with the inner annular ring formed and displacing a portion of said metal forming said outer annular ring; and

forming a bore and a hole to feed wire leads.

23. A field core shell formed by a method according to claims 20, 21 or 22.

24. The field core shell as claimed in claim 23 wherein the bore is sized for attachment to a shaft.

25. The field core shell as claimed in claim 23 wherein the inner annular ring and the outer annular rings extend in a direction that is perpendicular to the bottom surface of the disc and parallel to the center axis of the disc by the same distance.

26. The field core shell as claimed in claim 23 wherein the inner annular ring and the outer annular ring extend in a direction that is perpendicular to the bottom surface of the disc and parallel to the center axis of the disc and are tapered at an angle alpha.

27. A field core shell which comprises:

a spin-roll formed outer annular ring integral to and encircling a center axis of the disc and extending from the bottom external surface in a direction that is perpendicular to the bottom surface of the disc and parallel to the center axis of the disc;

a spin-roll formed inner annular ring integral to and encircling a center axis of the disc, said inner annular axis spaced radially inward from said outer annular ring and extending from the bottom external surface in a direction that is perpendicular to the bottom surface of the disc and parallel to the center axis of the disc; and

a spin-roll formed mounting flange integral to the disc and having a bore extending from the mounting flange to the bottom external surface of the disc.

28. A field core assembly comprising:

a wire winding pod having a top and bottom surface comprising an outer annular ring integral to and encircling a center axis of the wire winding pod and extending in a direction perpendicular to the bottom of the wire winding pod and parallel to the center axis of the wire winding pod, an inner annular ring integral to and encircling a center axis of the wire winding pod, said inner annular axis spaced radially inward from said outer annular ring and extending in a direction perpendicular to the bottom of the wire winding pod and parallel to the center axis of the wire winding pod;

a mounting flange that encircles a center axis of the wire winding pod and extends in a direction perpendicular to the top surface of the wire winding pod and parallel to the center axis of the wire winding pod, the wire winding pod having a bore extending from the mounting flange to the bottom of the wire winding pod and a hole in the top surface of the wire winding pod to feed wire winding leads;

wire windings located inside the wire winding pod having wire leads feed through the hole in the top surface of the wire winding pod; and

an electrical connector attached to the top surface of the wire winding pod for connecting said field core assembly to an external source.